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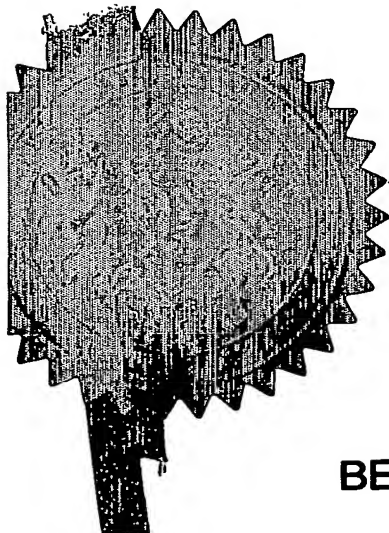
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# Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

1. Your reference

FOILED CONTAINER

2. Patent application number

(The Patent Office will fill in this part)

0205832.9

13 MAR 2002

3. Full name, address and postcode of the or of each applicant (underline all surnames)

ELOPAK SYSTEMS AG  
CHERSTRASSE 4  
POSTFACH  
CH-8152 GLATTBRUGG  
SWITZERLAND

Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

CANTON OF ZURICH, SWITZERLAND

4. Title of the invention

Improvements in or Relating to Containers and Methods of Production Thereof

5. Name of your agent (if you have one)

ANTHONY BURROWS

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

BUSINESS CENTRE WEST  
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LETCHWORTH GARDEN CITY  
HERTFORDSHIRE  
SG6 2HB

Patents ADP number (if you know it)

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number  
(if you know it)

Date of filing  
(day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing  
(day / month / year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

YES

- a) any applicant named in part 3 is not an inventor, or
  - b) there is an inventor who is not named as an applicant, or
  - c) any named applicant is a corporate body.
- See note (d))

# Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form

Description 10

Claim(s)

Abstract

Drawing(s)

5-1  
2-1

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

Request for preliminary examination and search (Patents Form 9/77)

Request for substantive examination (Patents Form 10/77)

Any other documents (please specify)

11. I/We request the grant of a patent on the basis of this application.

*Anthony Burrows*

Signature

ANTHONY BURROWS - AGENT

Date

12 March 2002

12. Name and daytime telephone number of person to contact in the United Kingdom

ANTHONY BURROWS  
01462-481755

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IMPROVEMENTS IN OR RELATING TO CONTAINERS AND  
METHODS OF PRODUCTION THEREOF

This invention relates to a container and to a method of production thereof.

5       The use of injection-moulded preforms in blow-moulding, particularly stretch blow-moulding of packaging container bodies for fluid products, particularly liquid products, is well known. It is also known, after filling of the container bodies, to apply foils to the axially outermost extremities  
10 of the open ends of the container bodies, especially in ultra-clean and aseptic packaging conditions, or, alternatively, to apply snap-on closures with frustum or so-called "valve" seals for secondary and primary sealing to the container bodies and so benefit from the associated weight-  
15 saving in the preform. The container bodies are usually in the form of bottles and made of PET (polyethylene terephthalate).

Another well known method of forming packaging container bodies is continuous extrusion blow-moulding in which a  
20 parison is extruded into a mould and then inflated to form the container body. It is again known, after filling of the container body, to apply a foil to the axially outermost extremity of the open end or, alternatively, to apply snap-on closures with valve seals. The container bodies are usually  
25 in the form of bottles and made of HDPE (high density polyethylene) or of multilayer plastics material.

According to a first aspect of the present invention,

there is provided a hollow preform for moulding to form a container and having an open end, an axially outermost extremity of said open end, and a shoulder inside said preform. at said open end, having a radially innermost diameter less than the internal diameter of said outermost extremity, and serving to have sealingly attached thereto a foil for closing said container at said shoulder.

According to a second aspect of the present invention, there is provided a container comprising:-

10 a hollow body having a mouth end, an axially outermost extremity of said mouth end, and a shoulder inside said body at said mouth end and having a radially innermost diameter less than the internal diameter of said outermost extremity, and

15 a foil closing said body at said shoulder and sealingly attached to said shoulder.

According to a third aspect of the present invention, there is provided a method comprising:-

forming a hollow body,  
20 filling said hollow body with a product, and  
closing said body with a foil, including sealingly attaching said foil to a shoulder which is located inside said body at a mouth end of said body and which has a radially innermost diameter less than the internal diameter  
25 of the axially outermost extremity of said mouth end.

Owing to these aspects of the invention, the outermost extremity of the mouth end of such container containing a

fluid product need not be deleteriously affected, in respect of its pouring properties and its consumer "feel", by application and removal of the foil.

5 The hollow body can have been made by blow-moulding from a preform or by blow-moulding with a parison.

The shoulder may be of planar form and extend in a radial plane; alternatively it may be of rounded form, especially at its inner periphery, or of frusto-conical form and co-axial with the mouth. If of frusto-conical form, it  
10 may be inwardly converging, commencing even at the axially outermost extremity of the mouth.

The foil is preferably a laminate comprised of metal, particularly aluminium, sandwiched between two differing plastics materials of which one has a significantly higher  
15 melting point than the other.

According to a fourth aspect of the present invention, there is provided a method of producing a sealed container, comprising providing a hollow preform having an open end, moulding said preform to form a hollow body having said open  
20 end, sealingly attaching a foil to said open end of said hollow body so as to close said body at said open end, and applying over the foil a removable closure so that an annular portion of said closure co-operates with an annular portion of said hollow body to provide a frustum seal therebetween.

25 According to a fifth aspect of the present invention, there is provided a container comprising a hollow body moulded from a preform, a foil sealingly attached to a mouth

end of said body so as to close said body at said mouth end, and a removable closure applied over the foil, an annular portion of said closure co-operating with an annular portion of said body so as to provide a frustum seal therebetween.

5           Owing to these two aspects of the invention, it is possible to provide for a container a good primary seal in the form of the foil, which is at least partly removed by peeling or rupturing when the hollow body is first opened, and a good secondary seal in the form of the frustum seal,  
10           which is restored upon re-closing of the hollow body with the removable closure.

          Furthermore, if the removable closure is in the form of a snap-on closure, as opposed to a screw closure, a significant weight saving in the preform and thus in the  
15           hollow body can be achieved because of the omission of the screw threading.

          If both the closure and the preform are produced by injection moulding, relatively tight manufacturing tolerances can be achieved, so that the valve seal is, generally, highly  
20           effective.

          According to a sixth aspect of the present invention, there is provided a method of producing a container including providing a foil-form disc with a foil-form pull tab integral with and projecting outwardly from the disc, sealingly  
25           attaching the disc to an open end of a hollow body, and bending the pull tab towards the middle of the disc.

          According to a seventh aspect of the present invention,

there is provided a container comprising a hollow body, a foil-form disc sealingly attached to a mouth end of said hollow body so as to close said body at said mouth end, a removable closure applied over said disc so as to leave a space therebetween, and a foil-form pull tab integral with said disc and extending in only said space from an outer peripheral edge of said disc.

Owing to these aspects of the present invention, the tab does not extend to between mutually co-operating surfaces of said body and said closure and thus does not interfere with such co-operation.

In order that the invention may be clearly and completely disclosed, reference will now be made, by way of example, to the accompanying drawings, in which:-

Figure 1 is a perspective view, in axial section, through an injection-moulded, thermoplastics preform,

Figure 2 is a perspective view, in axial section, illustrating a snap-on closure, a laminate foil, and, fragmentarily, a hollow body, of a container, the hollow body having been blow-moulded from the preform,

Figure 3 is a view similar to Figure 2 but showing the body, the foil and the closure assembled to form the container, and

Figure 4 is a fragmentary axial section through the top of the assembled container.

Referring to the drawings, the open, top end 4 of the preform 2 forms an unaltered, open, top end of the hollow



body 6 formed by stretch blow-moulding of the preform 2, and remains substantially unaltered after the foil 8 has been sealingly attached thereto and the snap-on closure, in the form of an overcap 10, has been applied thereto.

5       At its axially outermost extremity 12, the end 4 is formed with an easy pouring feature consisting of a thin, radially outwardly thinning, curled-over, annular lip 14. Below that lip is a thicker, snap ring 16 which, with an external, narrow, annular shoulder 18 delimits an external,  
10       shallow, annular recess 20 co-axial with the preform 2 and serving as a main securing point for the overcap 10. At the inside of the preform 2 and immediately beyond the extremity 12 is a frusto-conical surface 22 which tapers slightly axially inwardly of the preform 2 and acts as a guide for the  
15       foil 8 during application and as the valve seal of the overcap 10. Below the external shoulder 18 is an additional snap ring 24 as a secondary securing point for the overcap or, alternatively, for retaining a tamper band 26. The surface 22 terminates at an annular, radial, flat surface 28  
20       on the inside of the preform and constituting a shoulder onto which the foil 8 is welded to close the body 6 at its end 4. Below the ring 24 is a neck support ring 30 used for handling of the preforms 2 and the hollow bodies 6.

25       The foil 8 is of aluminium 32 laminated on both sides with plastics materials of which one (34) has a significantly higher melting point than the other (36), in such a way as to give an easily peelable laminate 36 on the hollow body side

and, on the other side, a laminate 34 that can withstand substantial heat and does not cause contamination of an applicator used for applying the foil 8 to the body 6. Conduction heat sealing or induction heat sealing can be used for the application. The foil 8 consists of a circular disc 38 with a tab 40 projecting unilaterally therefrom. The tab 40 would be designed in such a way that it effects an even tear after application of the foil, without the foil leaving any residue on the shoulder 28.

The foils are pre-cut from a laminate web and delivered in packs to a packager. These packs are then loaded into one or more magazines on a filler. If the filler has more than one line, the magazine has sub-sections equal in number to the number of lines on the filler. If the filler is multi-indexing, i.e. in the or each line a plurality of containers is filled simultaneously, then either the magazine has sub-sections equal in number to the number of containers filled simultaneously or a plurality of magazines is equal in number to the number of containers filled simultaneously and each magazine has sub-sections equal in number to the number of lines. Each magazine is designed in such a way that it can be reloaded during production without interference with production.

A pick-and-place unit is used to remove the foil 8 from the magazine and place it in a sterilising chamber. The foil remains flat and is sterilised on both sides. The foil is then picked from the sterilising chamber by a welding anvil

of the applicator and through applying vacuum. The anvil then places the foil into the body 6, pressing it onto the flat surface 28.

5 The rim bounded by the extremity 12 and the surface 22 acts as a folding device for the tab 40 on the disc 38 and this action tends to leave the tab 40 bent upwards. The foil is welded through conduction or induction heat. The lead-in 22 on the neck assists in the accurate and consistent placing of the foil 8 and reduces the accuracy required in the filler  
10 positioning.

A mechanism would then be used to fold the foil tab 40 back over the disc 38 either immediately after application of the disc, or later during forward indexing of the hollow body 6.

15 The overcap 10 can be a lightweight snap-on closure and need not have any specific, built-in, gas barrier properties. The overcap has a flexible, internal, co-axial skirt that co-operates with the surface 22 to provide the valve seal that gives secondary sealing functionality.

20 A tamper evidence band (26) could be built into the closure and would be designed in such a way that it is removed completely from the container after opening. Of the two snap rings 16 and 24, the ring 16 acts as the main location point for the overcap 10. This ring 16 does not  
25 project significantly from the base of the recess 20, and therefore the overcap 10 is made strong enough in this section to stay on the body 6. The snap ring 24 further down

the neck acts as an additional protrusion to secure the overcap during transport and handling and to retain the tamper band 26.

5 The overcap 10 could be applied outside the filler on a free-standing cap applicator. The control of this applicator could be integrated with that of the filler.

10 This overcap principle permits the applying of various cap designs with the same internal design features. This is beneficial should packagers require some branding feature on their closures. Also, a change in the overcap need not have an impact on the filler integrity since the overcap would not need to be sterilised and the cap applicator could be integrated with the filler only through electronic control.

15 As shown in Figure 3, the final assembly presents a foil-sealed container body 6 with a snap-on overcap 10.

The container described with reference to the drawings has the following features:-

- 1) A recess inside the hollow body 6 with a shoulder 28 onto which the foil 8 is placed and welded.
- 20 2) An easy-pouring, non-drip feature 14 incorporated in the pouring rim.
- 3) A snap-on overcap 10, with a valve seal 22/42 for good secondary sealing.
- 4) This overcap 10 has external tamper evidence 36, that  
25 could function in such a way that no parts remain on the body 6 after opening.
- 5) A peelable foil 8, cut in such a way that a pull tab 40

is provided as part of the foil.

6) The foil 8 is a laminate designed in such a way that it provides an integral gas-and liquid-tight seal.

7) The foil is easily removed without tearing, no foil  
5 remaining on the container body 6 and no risk of foil falling into the container body 6.

8) . With no foil left on the container body, the latter is more suitable for recycling than if a portion of the foil were to remain on the body.

10 9) Foil application is designed not to affect the pouring surface or consumer "feel" after peeling.

10) The foil acts as main tamper evidence.

11) A weight saving in the preform of between 10 and 15% is obtained when compared with current, standard, three-start  
15 thread necks, assuming, of course, that the non-neck parts of the container bodies are of equal weight to each other.

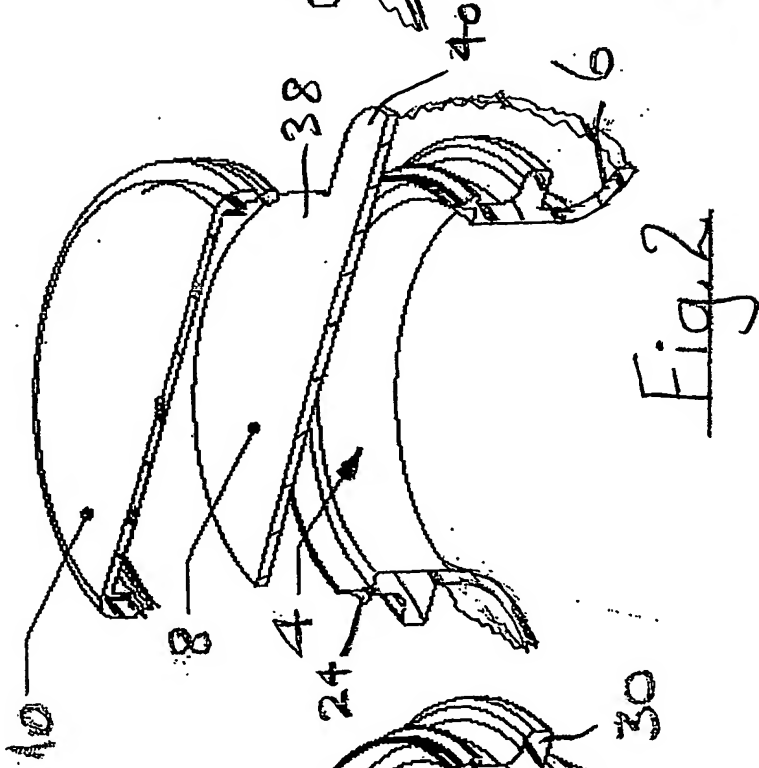
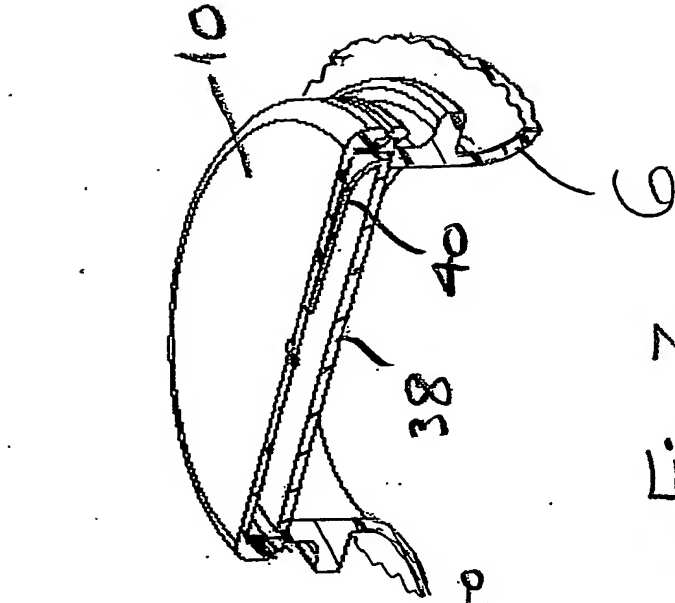
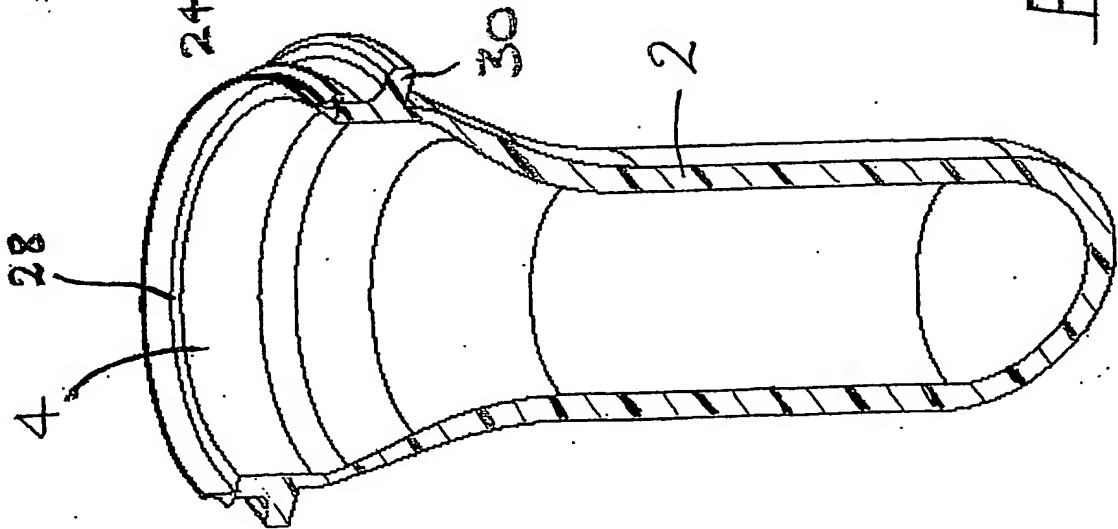
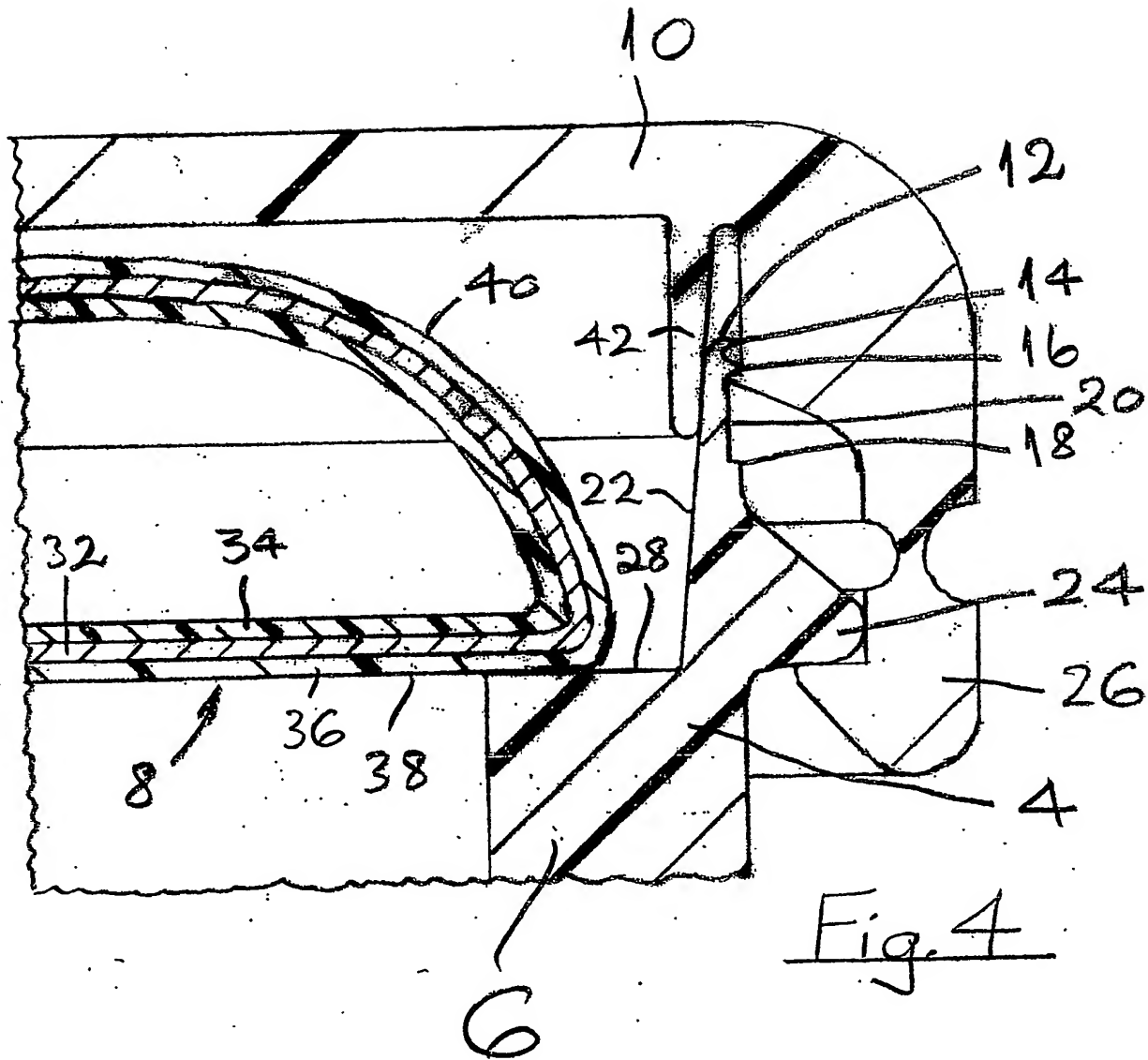


Fig. 1





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